Title: Predicting the Behaviour of Streaming Services Users

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Abstract: Streaming services are one of the phenomena of the last decade, allowing online legal access to media for a large number of users. The media is usually provided to the users as an automatically generated sequence, created by some form of a recommender system. The preferences of individual users are usually estimated based on historical data from their previous usage of the service. Skipping behaviour on individual elements of the generated sequence (songs, for instance) is one of the basic signals expressing these preferences. Goal of this work is to predict users‘ behaviour based on their previous experience with the service. We chose a large dataset consisting of real data from usage of the *Spotify* service, and considered options for preprocessing and representing them. We decided to use recurrent neural networks with the *Encoder-Decoder* architecture for modelling the behaviour of the users. These models encode the information about users‘ historical behaviour into a compact inner representation of the session, and based on that representation they generate expected behaviour in the next time steps. We created a model based on previous works, predicting complete users‘ behaviour during listening to *Spotify*’s playlists. Then, we extended this model using *transfer learning* technique for an easier task – predicting only the song skips. We achieved succesful results in that task in the context of the previous works, even though we were not able to effectively use all of the data due to the computational time.

Keywords: streaming services, machine learning, recurrent neural networks